

106TH CONGRESS
2D SESSION

S. 3282

To authorize funding for University Nuclear Science and Engineering Programs at the Department of Energy for fiscal years 2002 through 2006

IN THE SENATE OF THE UNITED STATES

DECEMBER 15 (legislative day, SEPTEMBER 22), 2000

Mr. BINGAMAN introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To authorize funding for University Nuclear Science and Engineering Programs at the Department of Energy for fiscal years 2002 through 2006.

1 Be it enacted by the Senate and House of Represent
2 tives of the United States of America in Congress assem

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as ``Department of Energy
5 University Nuclear Science and Engineering Act``.

6 **SEC. 2. FINDINGS**

7 The Congress finds the following:

8 (1) U.S. university nuclear science and engi-
9 neering programs are in a state of serious declin

10 The supply of bachelor degree nuclear science and

1 engineering personnel in the United States is at
2 35-year low. The number of four year degree nuclear
3 engineering programs has declined 50 percent to ap-
4 proximately 25 programs nationwide. Over two-
5 thirds of the faculty in these programs are 45 years
6 or older.

7 (2) Universities cannot afford to support their
8 research and training reactors. Since 1980, the
9 number of small training reactors in the United
10 States have declined by over 50 percent to 28 reac-
11 tors. Most of these reactors were built in the 1950s
12 and 1960s with 30- to 40-year operating li-
13 censes, and will require re-licensing in the next
14 several years.

15 (3) The neglect in human investment and train-
16 ing infrastructure is affecting 50 years of nation-
17 al R&D investment. The decline in a competent nuclear
18 workforce, and the lack of adequately trained nu-
19 clear scientists and engineers, will affect the abili-
20 ty of the United States to solve future waste storage
21 issues, maintain basic nuclear health physics pro-
22 grams, operate existing fission reactors in the
23 United States, respond to future nuclear events
24 worldwide, help stem the proliferation of nuclear

1 weapons, and design and operate naval nuclear reac-
2 tors.

3 (4) Further neglect in the nation's investment
4 in human resources for the nuclear sciences will lead
5 to a downward spiral. As the number of nuclear
6 science departments shrink, faculties age, and train-
7 ing reactors close, the appeal of nuclear science
8 be lost to future generations of students.

9 (5) The Department of Energy's Office of Nuclear
10 Science and Technology is well suited to help main-
11 tain tomorrow's human resource and training invest-
12 ment in the nuclear sciences. Through its support of
13 research and development pursuant to the Depart-
14 ment's statutory authorities, the Office of Nuclear
15 Science and Technology is the principal Federal
16 agent for civilian research in the nuclear sciences
17 the United States. The Office maintains the Nuclear
18 Engineering and Education Research Program
19 which funds basic nuclear science and engineering
20 The Office funds the Nuclear Energy and Research
21 Initiative which funds applied collaborative research
22 among universities, industry and national labora-
23 tories in the areas of proliferation resistant fuel
24 cles and future fission power systems. The Office
25 funds Universities to refuel training reactors for

1 highly enriched to low enriched proliferation toler
2 fuels, performs instrumentation upgrades and main-
3 tains a program of student fellowships for nuclea
4 science, engineering and health physics.

5 **SEC. 3. DEPARTMENT OF ENERGY PROGRAM.**

6 (a) ESTABLISHMENT.—The Secretary of Energy,
7 through the Office of Nuclear Science and Technology
8 shall support a program to maintain the Nation's human
9 resource investment and infrastructure in the nuclea
10 sciences and engineering consistent with the Department
11 statutory authorities related to civilian nuclear res
12 and development.

13 (b) DUTIES OF THE OFFICE OF NUCLEAR SCIENCE
14 AND TECHNOLOGY.—In carrying out the program under
15 this Act, the Director of the Office of Nuclear Science
16 Technology shall—

17 (1) develop a robust graduate and under-
18 graduate fellowship program to attract new and tal
19 ented students;

20 (2) assist universities in recruiting and retai
21 ing new faculty in the nuclear sciences and enginee
22 ing through a Junior Faculty Research Initiation
23 Grant Program;

1 (3) maintain a robust investment in the funda-
2 mental nuclear sciences and engineering through the
3 Nuclear Engineering Education Research Program;

4 (4) encourage collaborative nuclear research be-
5 tween industry, national laboratories and universit
6 through the Nuclear Energy Research Initiative; and

7 (5) support communication and outreach re-
8 lated to nuclear science and engineering.

9 (c) MAINTAINING UNIVERSITY RESEARCH AND
10 TRAINING REACTORS AND ASSOCIATED INFRASTRUC-
11 TURE.—Within the funds authorized to be appropriated
12 pursuant to this Act, the amounts specified under sect
13 4(b) shall, subject to appropriations, be available fo
14 following research and training reactor infrastru
15 maintenance and research:

16 (1) Refueling of research reactors with low en-
17 riched fuels, upgrade of operational instrumentatio
18 and sharing of reactors among universities.

19 (2) In collaboration with the U.S. nuclear in-
20 dustry, assistance, where necessary, in re-licens
21 and upgrading training reactors as part of a studen
22 training program.

23 (3) A reactor research and training award pro-
24 gram that provides for reactor improvements as part

1 of a focused effort that emphasizes research, training,
2 ing, and education.

3 (d) UNIVERSITY-DOE LABORATORY INTER-

4 ACTIONS.—The Secretary of Energy, through the Office
5 of Nuclear Science and Technology, shall develop—

6 (1) a sabbatical fellowship program for university
7 sity professors to spend extended periods of time
8 Department of Energy laboratories in the areas of
9 nuclear science; and

10 (2) a visiting scientist program in which laboratory
11 tory staff can spend time in academic nuclear
12 science and engineering departments.

13 The Secretary shall also provide for fellowships for
14 dents to spend time at Department of Energy laboratories
15 in the area of nuclear science.

16 (e) MERIT REVIEW REQUIRED.—All grants, contracts,
17 tracts, cooperative agreements, or other financial assistance
18 awards under this Act shall be made only after independent
19 merit review.

20 **SEC. 4. AUTHORIZATION OF APPROPRIATIONS.**

21 (a) TOTAL AUTHORIZATION.—The following sums
22 are authorized to be appropriated to the Secretary of
23 Energy, to remain available until expended, for the purpose
24 of carrying out this Act:

25 (1) \$44,200,000 for fiscal year 2002.

1 (2) \$56,450,000 for fiscal year 2003.

2 (3) \$63,100,000 for fiscal year 2004.

3 (4) \$61,100,000 for fiscal year 2005.

4 (5) \$71,700,000 for fiscal year 2006.

5 (b) GRADUATE AND UNDERGRADUATE FELLOW-

6 SHIPS.—Of the funds under subsection (a), the following

7 sums are authorized to be appropriated to carry out s

8 tion 3(b)(1):

9 (1) \$5,000,000 for fiscal year 2002.

10 (2) \$5,100,000 for fiscal year 2003.

11 (3) \$5,200,000 for fiscal year 2004.

12 (4) \$5,200,000 for fiscal year 2005.

13 (5) \$5,200,000 for fiscal year 2006.

14 (c) JUNIOR FACULTY RESEARCH INITIATION GRANT

15 PROGRAM.—Of the funds under subsection (a), the fol-

16 lowing sums are authorized to be appropriated to car

17 out section 3(b)(2):

18 (1) \$10,000,000 for fiscal year 2002.

19 (2) \$11,000,000 for fiscal year 2003.

20 (3) \$11,500,000 for fiscal year 2004.

21 (4) \$11,500,000 for fiscal year 2005.

22 (5) \$11,500,000 for fiscal year 2006.

23 (d) NUCLEAR ENGINEERING AND EDUCATION RE-

24 SEARCH PROGRAM.—Of the funds under subsection (a),

1 the following sums are authorized to be appropriated
 2 carry out section 3(b)(3):

3 (1) \$10,000,000 for fiscal year 2002.

4 (2) \$15,000,000 for fiscal year 2003.

5 (3) \$20,000,000 for fiscal year 2004.

6 (4) \$21,000,000 for fiscal year 2005.

7 (5) \$22,000,000 for fiscal year 2006.

8 (e) COMMUNICATION AND OUTREACH RELATED TO

9 NUCLEAR SCIENCE AND ENGINEERING.—Of the funds

10 under subsection (a), the following sums are authoriz

11 to be appropriated to carry out section 3(b)(5):

12 (1) \$200,000 for fiscal year 2002.

13 (2) \$250,000 for fiscal year 2003.

14 (3) \$300,000 for fiscal year 2004.

15 (4) \$300,000 for fiscal year 2005.

16 (5) \$300,000 for fiscal year 2006.

17 (f) REFUELING OF RESEARCH REACTORS AND IN-

18 STRUMENTATION UPGRADES.—Of the funds under sub-

19 section (a), the following sums are authorized to be ap

20 priated to carry out section 3(c)(1):

21 (1) \$6,000,000 for fiscal year 2002.

22 (2) \$6,500,000 for fiscal year 2003.

23 (3) \$7,000,000 for fiscal year 2004.

24 (4) \$7,000,000 for fiscal year 2005.

25 (5) \$7,000,000 for fiscal year 2006.

1 (g) RE-LICENSING ASSISTANCE.—Of the funds under
 2 subsection (a), the following sums are authorized to be
 3 appropriated to carry out section 3(c)(2):

4 (1) \$2,000,000 for fiscal year 2002.

5 (2) \$2,500,000 for fiscal year 2003.

6 (3) \$3,000,000 for fiscal year 2004.

7 (4) \$3,000,000 for fiscal year 2005.

8 (5) \$4,500,000 for fiscal year 2006.

9 (h) REACTOR RESEARCH AND TRAINING AWARD

10 PROGRAM.—Of the funds under subsection (a), the fol-
 11 lowing sums are authorized to be appropriated to car-
 12 ry out section 3(c)(3):

13 (1) \$10,000,000 for fiscal year 2002.

14 (2) \$15,000,000 for fiscal year 2003.

15 (3) \$15,000,000 for fiscal year 2004.

16 (4) \$17,000,000 for fiscal year 2005.

17 (5) \$20,000,000 for fiscal year 2006.

18 (i) UNIVERSITY-DOE LABORATORY INTER-

19 ACTIONS.—Of the funds under subsection (a), the fol-
 20 lowing sums are authorized to be appropriated to car-
 21 ry out section 3(d):

22 (1) \$1,000,000 for fiscal year 2002.

23 (2) \$1,100,000 for fiscal year 2003.

24 (3) \$1,100,000 for fiscal year 2004.

25 (4) \$1,100,000 for fiscal year 2005.

1 (5) \$1,200,000 for fiscal year 2006.
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